

LA-UR-21-29073

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Title: Production Qualification Training Course 7 of 8 Exception
Authorization

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Production Qualification Training

Course 7 of 8

Exception Authorization

Joint Initiative: W-8 Group and ALDW-DAQ

Curriculum Overview

This curriculum is intended to:

- Teach you about Exception Authorization
- Explain the course subject in detail
- Provide references and guides to help you after viewing the training



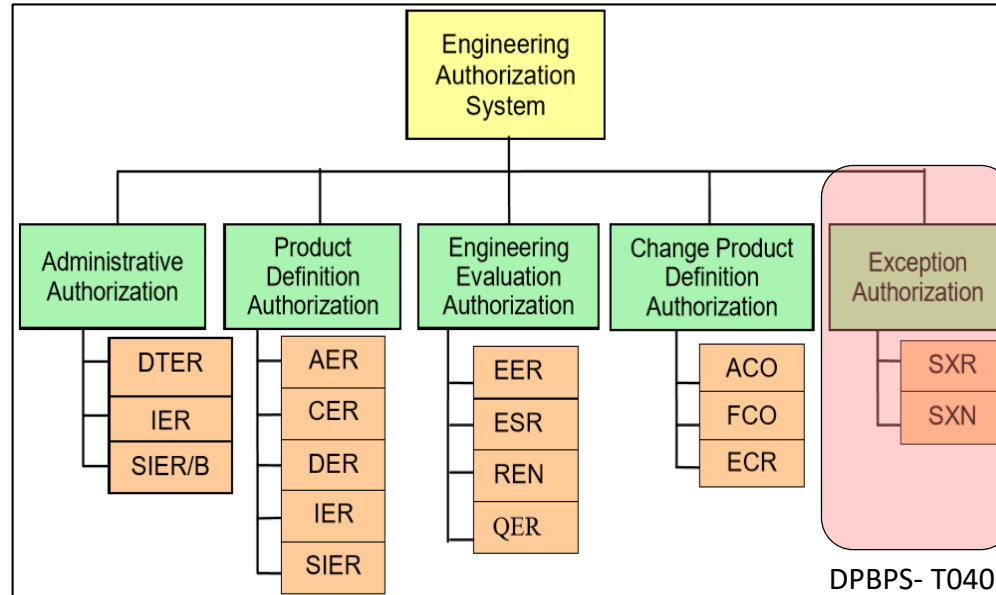
Utrain Course	Procedure	Title	Course #
RR 49297	W-SE-0008	Engineering Authorization System	Course 1
RR 49256	W-SE-0044	Production Qualification Procedure	Course 2
	W-DG-0003	Engineering Evaluation Plan Template	Course 2
	W-DG-0004	EE Data Package Template	Course 2
	W-DG-0005	Engineering Evaluation (EE Data Package Checklist)	Course 2
RR 49262	W-SE-0046	Administrative IER and SIER/B Procedure	Course 3
RR 49272	W-SE-0051	Definition IER and SIER Procedure	Course 4
RR 49273	W-SE-0052	DER, AER, CER Procedure	Course 4
RR 49268	W-SE-0048	Re-evaluation Notices (RENs) Procedure	Course 5
RR 49256	W-SE-0049	Engineering Evaluation Release Procedure	Course 5
RR 49271	W-SE-0050	Qualification Evaluation Release Procedure	Course 5
RR 49298	W-SE-0047	Advanced Change Orders, Final Change Orders, and Engineering Change Requests Procedure	Course 6
RR 49257	W-SE-0045	SXN/SXR Procedure	Course 7
RR 53083	TBD	Engineering Evaluation Overview	Course 8
	W-DG-0002	EA Cheatsheet and Checklist Desktop Guide	All



Engineering Authorization System Overview

The Engineering Authorization (EA) System provides a formal communication method among M&O contractors, including configuration control and record management of EAs.

EAs authorize actions that affect product definition and related product and document information related to development, production, surveillance and dismantlement activities.



Training Objectives

- At the end of this training, you will:
 - Recognize the two types of exception authorization releases and their usage
 - Understand the requirements for the two types of exception releases
 - Understand the different usage cases for the SXR
 - Understand the two categories of use restrictions in the SXR
 - Know where to gain assistance in executing an exception release
 - Understand the requirements for corrective actions as related to exception releases
- What this training will not do:
 - Train you on how to navigate the EA tool (Arbortext), PDMLink, or PRIME.
 - Authorize you to author or approve EAs



Exception Release Types

Weapon Engineers use Specification Exception Notices (SXNs) and Specification Exception Releases (SXR) within the EA System to document exceptions that affect design definition, product requirements, qualification status, and production activities. Nonconformances may be either technical or administrative.

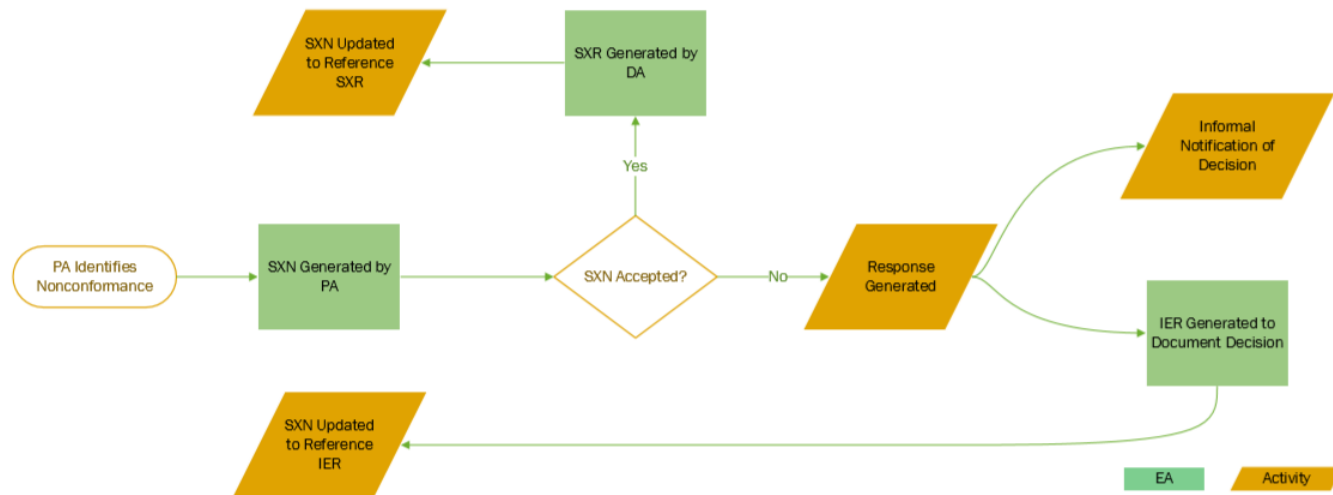
EA Type	Prepared By	
SXN	Production Agency	A notification for use of the non-conforming product, raw materials, or acceptance equipment. The decision to accept or reject the SXN is documented in a revision of the SXN.
SXR	Design Agency	An authorization for use of the non-conforming product, raw materials, or acceptance equipment. If accepted, the SXR references the SXN.



The use of SXNs and SXRs is mandatory for weapon production and surveillance work for the Product Realization Process



Process Overview of SXN and SXR Usage Per W-SE-0045U



SXN and SXR EAs provide a sound technical basis for requests and approvals of deviations to product requirements. These EAs are records of usage authorization for product that would otherwise be unsuitable for application. The soundness of decision relies on ensuring that all requirements are addressed properly and in accordance with applicable rules and regulations

Data Fields Common to Both SXNs and SXR

Weapon Programs



Related
Authorizations

Part Number



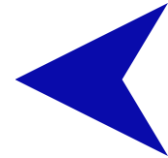
Affected Assembly



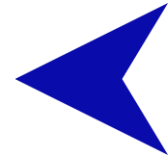
Serial Numbers



Integrated
Contractor Order
(ICO)



References and
Remarks



Distribution List



Non-Conforming
Product List



Reason for Release



Approvers



Deviated
Requirements and
Non-Conforming
Products



Specification Exception Notice (SXN)



There are a number of requirements specific to an SXN:

- The SXN documents the requirement that was violated, the details of the violation, the suggested use restriction, causes, and corrective actions
- The SXN includes serial numbers, lot numbers, or other unique identification for traceability.
- The SXN is mandatory only under certain conditions (violation of a Pentagon // or /S/ requirement)
 - SXN/SXR are optional during development activities unless the product is intended for WR use
- The DA must review and accept or reject an SXN within 30 days
- The SXN is revised to document acceptance or rejection in the Authorization Details section. If accepted, the SXN is followed up by the DA issuance of an SXR which references the SXN

To ensure unambiguous communication of the nonconformance, its causes, and the corrective actions to be taken by the PA, it is the LANL DA business practice to require an SXN prior to the issuance of an SXR.



The DA has the burden to reject the SXN if it is incomplete or incorrect

Specification Exception Release (SXR)

There are a number of requirements specific to an SXR:

- The SXR must include a Severity Class (A, B, or C) determination
- The SXR must reference the SXN
- The SXR authorizes either “Unrestricted” or “Restricted” use
 - Unrestricted and restricted use product must not be authorized in the same release
- The SXR states the requirement that was deviated and the details of the deviation
- The SXR includes serial numbers, lot numbers, or other unambiguous identification for traceability



The DA must not accept the risk of answering for PA errors that are not related to requirements!

SXR General Requirements

- The SXR must include the corrective action taken to be taken by the PA or DA or both to preclude the same nonconformance from occurring on future product, or provide justification why corrective action is not needed

Either:

1. State “NONE”; and
2. Document the justification for NO corrective action required

Or:

1. List action taken, or to be taken to preclude the same nonconformance from occurring on future product
 2. State the Contractor who is responsible for the corrective actions; and
 3. Document the Contractor corrective action system “identifier” for the corrective action response (CAR) to enable traceability and tracking within the contractors corrective action process
- Use W-FORM-0025 to submit LANL DA corrective actions to ALDW-DAQ for tracking in the LANL NIT System



SXR General Requirements

- Delegation:
 - When delegated by the DA in writing (e.g., an IER), the PA may issue an SXR against Pentagon /M/ requirements with distribution to the DA for review to ensure that design intent is met.
 - When delegated by the DA in writing (e.g., an IER), the PA may authorize the use of nonconforming gaging equipment without DA approval under the circumstances listed below. The PA must keep a record of the measured values of all dimensions that deviated from items a through e below:
 - a. The dimensions are not identified on the Gage Acceptance and Recertification List;
 - b. The Acceptance and Recertification dimensions will not affect the function or acceptance intent of the equipment;
 - c. The Acceptance and Recertification dimensions will result in a decrease of related product tolerance;
 - d. The gage dimensions require deviation charts for setup of readout equipment, i.e., masters, contour templates, etc.; and,
 - e. The gage dimensions are within the limits of accuracy of the measurement laboratory equipment and personnel.



SXR Severity Classes

- Severity Class A:
 - The nonconformance is **measurable** and it **violates an interface requirement** specified in a Compatibility Definition (CD), Mechanical Envelope (ME), Environment Specification (ES), Interface Definition (ID) or equivalent interface requirements documents but the nonconformance does not violate customer requirements specified in Military Characteristics (MCs), Stockpile-to-Target Sequence (STS), or military service Interface Control Drawings (ICDs).
- Severity Class B:
 - the nonconformance is **measurable or at least observable** and the nonconformance does not violate an interface requirement specified in a CD, ME, ES, ID or equivalent interface requirements document.
- Severity Class C:
 - the product nonconformance is **not measurable and/or observable** and the nonconformance does not violate an interface requirement specified in a CD, ME, ES, ID or equivalent interface requirements document.



SXR Types

- SXR for PRODUCT
- SXR for GENERAL USE MATERIALS OR PARTS
- SXR as a PRE-PLANNED TEMPORARY CHANGE
- SXR for ACCEPTANCE EQUIPMENT



Product Type SXR

- The SXR is a mandatory EA for authorizing the use of a specific quantity of product (pilot production or production) that does not conform to its production or surveillance requirements, and after engineering assessment it is determined that the nonconforming product does not adversely affect safety, operability, reliability, interchangeability, assembly, storage life, completeness of assembly, or the ultimate use
- The use of the SXR is optional for development product
- PPI units that do not meet all drawing requirements (other than the drawing note that requires an Engineering Evaluation) will require disposition by SXR if they are shipped inter-plant for next assembly PPI use
- If a production agency plans to use PPI units for qualification evaluation and/or War Reserve (or JTA or TYPE) units, SXRs will be required to authorize use of nonconforming units intra-plant as well as inter-plant



Product Type SXR

- The SXR is a mandatory EA for authorizing the use of a specific quantity of product (pilot production or production) that does not conform to its production or surveillance requirements, and after engineering assessment it is determined that the nonconforming product does not adversely affect safety, operability, reliability, interchangeability, assembly, storage life, completeness of assembly, or the ultimate use
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Product Type SXR

- Restricted Use SXRs must always specify marking of the product and any Interim Assemblies
 - If marking cannot be accomplished for restricted use items, then a statement must be included indicating the decision to not mark
 - For Restricted Use SXRs, mark the authorized application; e.g., “FOR TYPE 3A USE ONLY”
 - When WR items are restricted to a non-WR application, the part number suffix is lined through but not obliterated in addition to the above marking
- Marking may be applied for identification and control of unrestricted use items as deemed necessary by engineers
 - When marking is specified by the SXR, the SXR number, without revision number, must be marked on nonconforming product or acceptance equipment
- Marking must be accomplished using the same method required for part marking by the part defining drawing, modified by any specific instructions contained in the SXR
- When the discrepancy, and/or marked SXR number, will be discernible to the Ultimate User, the SXR number must be entered on the IRC, NORC, or DDF with a description of the discrepancy and the location of the discrepancy
 - The design agency engineer provides instructions to the production agency engineer, in the SXR, for marking and for entries on the IRC, NORC, or DDF



Product Type SXR

- The responsible design engineer coordinates approval of an SXR with the next assembly user or support group, and references such actions on the SXR (TBP-702 and T047)
 - NES Issues
 - Reliability Impacts
 - DoD Interfaces
- SXR distribution should include the PA QA personnel



General Use Raw Materials or Parts SXR

- An SXR may authorize the use of non-conforming general use materials or parts
 - Such SXRs are best issued as restricted for the specific application
- If issued, such an unrestricted use SXR must contain a statement explaining the basis for DA/PA agreement that future product applications will not be adversely impacted



This type of SXR, if issued as “unrestricted” allows use of the non-conforming materials or parts in all current or future applications calling for these materials or parts. It is better to restrict use to a specific use, or to issue a new specification for the non-conforming materials or parts and add this specification to appropriate applications as an alternate.



Preplanned Temporary Change SXR

- The pre-planned temporary change SXR authorizes a temporary change to a drawing requirement in advance of product fabrication and/or testing
- The pre-planned temporary change SXR is only applicable to products that meet all functional and next assembly requirements
- The SXR must have clearly stated limits to time/duration of the deviation
- Serial or lot numbers, when required by product drawing, must be cited within the SXR, either originally or by revision
- The References and Remarks field of the SXR should document the conditions that necessitate this being a preplanned temporary change SXR



It is the LANL DA Policy not to issue preplanned temporary change SXRs except on a case-by-case basis with Division Office approval.



SXR for Acceptance Equipment (AE)

An SXR may authorize the use of non-conforming acceptance equipment (AE)

- Approval by SXR to use nonconforming acceptance equipment also approves all accepted products using that equipment. No product SXRs are required unless specifically stated in the AE SXR.
- All current applications of the equipment must be considered when generating/approving the SXR.
- An approved nonconformance on a specific unit of acceptance equipment does not apply to other units of the same design.
- Once an SXR for a nonconformance to a feature or dimension on a specific unit of acceptance equipment has been approved, another approval of the same nonconformance on the specified unit is not required at subsequent inspection and recertification intervals unless the nonconformance is greater than that previously approved.




A piece of acceptance equipment routinely comes in out of tolerance at calibration or recertification. The out of tolerance condition impacts a measurement region not used in acceptance of product. In this case, the out of tolerance condition may be deviated by SXR.



Desktop Guide, W-DG-0002

- A desktop guide has been generated to aid in validating, authoring and approving EAs
- Relative to Exception Releases, the guide includes
 - A checklist for verifying that an SXN received from a PA is valid is included
 - A users guide to creating an SXR

 <p>Weapons Program Desktop Guide</p>		
<p>EA Cheatsheet and Checklist Desktop Guide</p> <p>Los Alamos National Laboratory • P.O. Box 1663, Los Alamos, NM 87545</p>		
Number	Revision	Effective Date
W-DG-0002U	C	August 12, 2021



Specification Exception Release (SXR) Checklist

SXN Acceptance Checklist			Overall Disposition	
SXN			Accept	Reject
#	Category	Check	Yes	No
1	Affected Assemblies	Is this field blank or none?	Reject	
2	Related Authorizations	Is this field blank or none?		
3	Related Authorizations	Does the EA have initiating docs listed? [Examples: SIER, SXN]		
4	Distribution	Does the EA have a Production Liaison listed? [Clarification: LANL, W-8]		Reject
5	Distribution	Does the EA have both W&Q Tails listed? [Clarification: LANL, Q-15/Q-17 and LANL, W-1/W-4]		Reject
6	Distribution	Does the EA have DA Quality listed? [Clarification: LANL, W-QPO]		Reject
7	Nonconforming Product List	Does the EA list a part number with a suffix?		Reject
8	Nonconforming Product List	Does the EA list a Total Quantity?		Reject
9	Nonconforming Product List	Does the EA list a Unit of Measure?		Reject
10	Nonconforming Product List	Does the EA list a Part Name?		Reject
11	Deviated Requirements	Does the EA list a part number and issue (if applicable)?		Reject
	Deviated Requirements	Does the EA reference product definition (Choose one from the following)? * Does the EA have Drawing References [Notes, or Zones] listed? * Does the EA have Product Specification References [Section, Image, Table, or Appendix] listed?		Reject
12	Nonconforming Products	Does the EA have at least one category [Mfr Code, Serial Number, Date Code, or Lot Number] listed?		Reject

14	Corrective Action	Is this field blank or none (with no explanation)? [Clarification: Per NAP-24A Attachment 3 para 3.2.3.c, a statement of None is acceptable with justification as to why no corrective action is required.]	Reject	
14a	Corrective Action	Does the EA list Production Agency info [CAR#, Responsible Associate, or Estimated Completion Date]? [Clarification: This applies only if Corrective Actions are required. See #14.]		Reject
15	Marking Instructions	Is this field blank? [Clarification: Restricted Use SXRs require marking.]		
15a	Marking Instructions	Does the EA list Specification 9919100?		
15b	Marking Instructions	Does the EA list Packaging Information/Class?		
15c	Marking Instructions	If Restricted; Does the EA list to mark Part SXR # "NXXXXXXXXXLA"?		Reject
15d	Marking Instructions	If Restricted to non-WR use; Does the EA list line through suffix instructions?		Reject
15e	Marking Instructions	If Restricted; Does the EA list part usage instructions?		Reject
16	Multiple Part Numbers/Multiple Deviations	Does the EA list multiple parts and multiple deviations?	Reject	
15	Multiple Part Numbers/Same Deviation	Does the EA list multiple parts with the same deviation?		
16	Same Part Number/Multiple Deviations	Does the EA list the same part with multiple deviations?		
17	Same Part Number/Same Deviation	Does the EA list the same part with the same deviation?		



SXR Cheat Sheet

SAMPLE

SXR Cheatsheet

Rev C

References:
NAP24
T047
T040
W-SE-0045

This document: W-DG-0002

- An SXR is only issued in response to an SXN
- A Restricted Use SXR doesn't necessarily limit the usage to non-WR
- Root Cause information is usually necessary for proper assessment of program and product risk, and can be elevated to a Re-EE
- If Corrective Action details are required for the SXR to be granted, NAP24 authorizes the DA to review this information

NWC Release Date: 2018 08 01 6:30:05 MT
Category: Exception Release
Authorization Title: Specification Exception Release
Document Number: N1234LA2018KC
Revision: 0

Weapon Program: B2-1
Affected Assemblies: 1K9876
Related Authorizations: SXN N4321KC2018LA

Code: SXR

Severity Class: B

Product Use Limitation: RESTRICTED

If the defect is measurable, Severity Class must not be "C"

UNRESTRICTED means the deviated product can be used ANYWHERE that part number is called out. Any restrictions on part usage result in a RESTRICTED SXR e.g. matching assembled serial numbers (selective assembly).

The next thing that is affected by this deviation. Usually the next level assembly.

SXN number is required

APPROVAL

Site	Name
LA	Someone Here
LA	Someone Else Here

Organization
Q-nn
W-nn

Date Approved
2018-08-01
2018-08-01

ALT/LEP and Legacy Program Group Leader and author's GL must approve (Post QER, W/Q Divisions must approve)



SXR Cheat Sheet

SAMPLE

DISTRIBUTION

	<u>Site</u>	<u>Name</u>	<u>Organization</u>	<u>Phone Number</u>	<u>E-Mail</u>
From:	LA	Someone Here	nnn	505-456-7890	zzzz@lanl.gov
To:	KC	Someone There	nnn	816-456-7890	yyyy@kcp.com
Copy To:	LA	Someone Else	nnn	505-456-7891	xxxx@lanl.gov
	KC	Another Person	nnn	816-456-7891	www@kcp.com

Incorrect or wrong classified email addresses⁸
prevent proper routing

Minimum distribution should include PA
Quality⁹

REASON FOR RELEASE

/Rev 0/ (2018-08-01)

1.0 Authorize limited exception to accept failed Inside Corner Max Radius for listed Lot 5 serial numbers.

Briefly summarize the purpose for this SXR¹⁰

REFERENCE AND REMARKS

1.0 DA evaluation of failing measurement indicates adequate margin for next level assembly. Investigation shows that the defects do not adversely affect safety, operability, reliability, interchangeability, assembly, storage life, completeness of assembly, or the ultimate use.

Document the DA's complete administrative and technical justification of why this deviated product is not a problem for the authorized use (next level assembly interferences/impacts over the life of the product)¹¹

NON-CONFORMING PRODUCT LIST

<u>Part Number</u>	<u>Total Qty</u>	<u>Unit of Measure</u>	<u>Part Name</u>
1K1234-00	2	EA	STUFF

List the part numbers the DA is allowing to be accepted – listing different part numbers is allowed if identical defects are being assessed¹²



SXR Cheat Sheet

SAMPLE

DEVIATED REQUIREMENTS AND NON-CONFORMING PRODUCTS

1.0 DEVIATED REQUIREMENT

1.0 Drawing: 1K1234

Issue: M

Requirement

1.0.1.0 /D/ Note 5: Radius inside corners to 0.05 Max

Deviation / Nonconformance:

1.0.1.0 Inside corner area measures 0.051 at 0.315 past point M

The product definition (drawing or support doc) number and issue letter to which the product is non-conforming

The specific requirement to which the product is non-conforming (including pentagon marking). Be sure to include outstanding ACO's changes. Note: all drawing or support doc features are pentagon D, unless otherwise marked.

The as-found details of the failing measurement or parameter. Identify defects by serial numbers, if needed.

NON-CONFORMING PRODUCTS

1.0 Part Number: 1K1234-00

Mfr Code

Serial Number

Date Code

Lot Number

ABC

210

K18

5

ABC

212

K18

5

List the serial numbers the DA is allowing to be accepted, other identification is very useful

CORRECTIVE ACTION

1.0

Fix the tool – replace with inspected insert, verify tolerance analysis, verify sample run, shorten re-inspection period – Assignee: Someone There, expected completion 1SEP18, KCNSC CAR# 20180001-01

Summarize what will be done to prevent the same defect from being produced again - don't focus on ways to catch defects. Think about updating product definition. At least: Name, Date, Number, Summary.

MARKING INSTRUCTIONS



SXR Cheat Sheet

SAMPLE

MARKING INSTRUCTIONS

1.0

Mark SXR number per 9919100 Class H-1 Indirect Method Bag as authorized in PS1K1234

USE RESTRICTION INSTRUCTIONS

Product
1K1234-00

Interim Assembly
N/A

Unique Assembly
1K9876

Product Name, Date, Number, Summary

Restricted SXRs always have the SXR # added to parts. Unrestricted product can have the SXR number marked if the DA requires it. Limit this section to the SXR #, lining-through and usage indications. Don't specify NNSA stamping.

RESTRICTED SXRs need this defined



Minimum Required Approvals per W-SE-0045U

Usage	W-DO ¹	Q-DO ²	System Group Office	Production Liaison Group Office	Surveillance Group Office	GTS ³ Group Office	Detonator Group Office	Author's Group Office
Pre-QE (Product)			X	X				X
Pre-QE (GTS ³ Product)			X	X		X		X
Pre-QE (Detonator Product)			X	X			X	X
QE onward (Product)	X	X	X	X				X
QE onward (GTS ³ Product)	X	X	X	X		X		X
QE onward (Detonator Product)	X	X	X	X			X	X
Surveillance (Product)			X	X	X			X
Surveillance (GTS ³ Product)			X	X	X	X		X
Surveillance (Detonator Product)			X	X	X		X	X
1 Weapon Systems Engineering Division Office (W-DO) 2 Weapon Stockpile Modernization Division Office (Q-DO) 3 Gas transfer system (GTS)								



Correcting Release of an Improper SXR

- When a published SXR has allowed the use of product or acceptance equipment that does not fulfill the design intent, the Design Agency engineer must immediately contact the production agency
 - The design or production agency engineers must revise and release the SXR to reflect a cancellation or modification
 - If canceled, a copy is sent to the appropriate site Quality Assurance department



Summary

SXN: PA formal request for acceptance of a deviation from requirements

SXR: Granting of an exception to requirements for either unrestricted or restricted use

Notes:

- Certain authorities for issuance of SXRs may be delegated to the PA
- SXRs against general use raw materials or parts, acceptance equipment, and pre-planned SXRs are only to be issued with DO approval on a case-by-case basis due to the elevated risk posed by such authorizations



References

Number	Title	Website
DBBPS -T040	<i>Engineering Authorization System</i>	https://dpbps.sandia.gov/SitePages/homepage.aspx
DBBPS -T038	<i>Procurement Definition</i>	https://dpbps.sandia.gov/SitePages/homepage.aspx
DBBPS -T053	<i>Transfer of Product Definition Responsibilities Business Rules</i>	https://dpbps.sandia.gov/SitePages/homepage.aspx
W-SE-0045U	<i>SXN/SXR Procedure</i>	https://int.lanl.gov/org/ddw/alldw/office-design-agency-quality/design-agency-procedures/system-engineering-procedures.shtml
W-DG-0002	<i>EA Cheatsheet and Checklist Desktop Guide</i>	https://int.lanl.gov/org/ddw/alldw/office-design-agency-quality/design-agency-procedures/desktop-guides.shtml



Resources

When you have issues or questions regarding the Engineering Authorization System, there are resources you can go to:

- ALDW Office of Design Agency Quality (ALDW-DAQ)
- Production Liaison Group (W-8)
- Engineering Authorization Team (W-11)
- W- and Q- Division Group Leaders
- This training



Acronyms

DTER	Drawing Transfer Engineering Authorization
IER	Information Engineering Authorization
SIER/B	Special Instruction Engineering Release/B Authorization
AER	Advanced Engineering Authorization
CER	Complete Engineering Authorization
DER	Development Engineering Authorization
SIER	Special Instruction Engineering Authorization
EER	Engineering Evaluation Authorization
ESR	Evaluation Status Release



Acronyms (continued)

REN	Reevaluation Notification Authorization
QER	Qualification Evaluation Authorization
ECR	Engineering Change Request Authorization
ACO	Advanced Change Authorization
FCO	Final Change Authorization
SXN	Specification Exception Notice Authorization
SXR	Specification Exception Authorization
DA	Design Agency
PA	Production Agency
DPBPS	Defense Programs Business Process System
M&O Contractors	KCNSC / LANL / LLNL / NNSS / PX/ SNL / SRS / Y-12



Course 7: Complete

